WHAT IS CLAIMED IS:

1. A process for producing aligned carbon nanotube films, wherein a carbon compound is decomposed using a substrate that is coated with an element having no catalytic ability by itself and which loads a metallic element having catalytic ability or a compound thereof, thereby forming a film of carbon nanotubes on the surface of said substrate which are aligned in a direction perpendicular to said substrate.

2. The process according to claim 1, which comprises the steps of coating the substrate with an element having no catalytic ability by itself, allowing a metallic element having catalytic ability or a compound thereof to be loaded on the substrate, and decomposing the carbon compound.

3. The process according to claim 2, wherein the element having no catalytic ability by itself is at least one element of groups IVa, Va, IIIb and IVb of the periodic table.

4. The process according to claim 2, wherein in the step of coating the substrate with the element having no catalytic ability by itself, said element is coated in a thickness of 5 nm to 100 μm on the surface of said substrate.

5. The process according to claim 4, wherein in the step of coating the substrate with the element having no catalytic ability by itself, said element is coated in a thickness of 0.05 nm to 5 μm on the surface of said substrate.

6. The process according to claim 1, wherein the metallic element having catalytic ability is at least one metallic element of groups VIa, VIIa and VIII of the periodic table.

7. The process according to claim 2, wherein the step of allowing the metallic element having catalytic ability or a compound thereof to be loaded on the substrate is performed by impregnation, dipping or a sol-gel process.

8. The process according to claim 1, wherein the metallic element having catalytic ability or a compound thereof comprises particles with a size of 0.1 to 50 nm.

9. The process according to claim 8, wherein the metallic element having catalytic ability or a compound thereof comprises particles with a size of 1 to 20 nm.

10. The process according to claim 3, wherein the element having no catalytic ability by itself is aluminum or germanium.

11. The process according to claim 6, wherein the metal element having catalytic ability is cobalt.

12. The process according to claim 1, wherein the element having no catalytic ability by itself is aluminum and the metallic element having catalytic ability is cobalt.

13. The process according to any one of claims 1 - 12, wherein the substrate is a ceramic sheet.

14. A process for producing aligned carbon nanotube films, wherein a carbon compound is decomposed using a substrate that is obtained by allowing a cobalt compound to be loaded on an aluminum-coated ceramic sheet and calcining

the ceramic sheet, thereby forming a film of carbon nanotubes on the surface of said substrate which are aligned in a direction perpendicular to said substrate.

15. The process according to claim 14, wherein the cobalt compound is at least one member of the group consisting of cobalt nitrate, cobalt chloride, cobalt fluoride, cobalt bromide, cobalt iodide, cobalt sulfate, cobalt carbonate, cobalt acetate, cobalt naphthenate, cobalt octacarbonyl, cobalt phthalocyanine, cobalt hydroxide and cobalt oxide.

16. The process according to claim 14, wherein the cobalt compound is a suspension of cobalt hydroxide obtained by adding a base to an aqueous solution of a cobalt salt.

17. The process according to claim 16, wherein the cobalt salt is cobalt nitrate, cobalt chloride, cobalt fluoride, cobalt bromide, cobalt iodide, cobalt sulfate, cobalt carbonate, cobalt acetate or cobalt naphthenate.

18. The process according to claim 16 or 17, wherein the base is ammonia or a water-soluble amine.

19. The process according to claim 18, wherein aqueous ammonia is used as the base.

20. The process according to any one of claims 14 - 19, wherein the cobalt compound which is loaded on the aluminum-coated ceramic sheet comprises particles with a size of 1 nm to 100 nm.

21. The process according to any one of claims 14 - 20, wherein the cobalt compound is loaded by impregnation, dipping, a sol-gel process or a reverse micelle process.

22. The process according to any one of claims 14 - 21,

wherein the calcining temperature is between 300 and 800°C.

23. The process according to any one of claims 13 - 22, wherein the ceramic sheet is a porous ceramic sheet.

24. The process according to any one of claims 13 - 23, wherein the ceramic sheet is made of silica-alumina.

25. The process according to any one of claims 13 - 24, wherein the ceramic sheet is heated to dry before aluminum is deposited.

26. The process according to any one of claims 14 - 25, wherein aluminum is deposited by vacuum deposition, electrochemical deposition or sputtering.

27. The process according to any one of claims 1 - 26, wherein the carbon compound is at least one member of the group consisting of saturated hydrocarbon compounds, unsaturated hydrocarbon compounds, aromatic hydrocarbon compounds and oxygen-containing hydrocarbon compounds.

28. The process according to any one of claims 1 - 27, wherein the reaction temperature for the step of decomposing the carbon compound is between 400 and 1100°C.